

# CULVERT PLAN REVIEW CHECKLIST

County: \_\_\_\_\_ Design No.: \_\_\_\_\_ By: \_\_\_\_\_ Date: \_\_\_\_\_  
Project Name: \_\_\_\_\_

## 1. GENERAL - ALL PROJECTS

### 1.1 Title Block

\_\_\_\_\_ "Design For (xx Skew) (RA)(LA)" "Design For Repair To (xx Skew (RA)(LA))."

\_\_\_\_\_ Structure Type and Size (Ex.: "Twin 12' x 12' x 240'-0 RCB Culvert" "3.0 m x 3.0 m x 100 m RCB Culvert").

\_\_\_\_\_ Sheet Title (Ex.: "General Notes & Culvert Quantities").

\_\_\_\_\_ Station of culvert (mainline) and of feature crossed (Highway, Street, R.R., etc.). Mainline culvert station should agree with envelope. See T.S. & L. for new structure.

\_\_\_\_\_ Turn In Date (Ex.: "December 2010").

\_\_\_\_\_ County

\_\_\_\_\_ "Iowa Department of Transportation - Highway Division."

\_\_\_\_\_ "Design Sht. No. x of x", "File No.", "Design No."

\_\_\_\_\_ Box around title block.

### 1.2 General

\_\_\_\_\_ Check plan constructability. Sufficient details included to guide contractor. Staging sequence provided if required.

\_\_\_\_\_ Scale not shown on situation plan or any details.

\_\_\_\_\_ Details consistent with culvert standard sheets.

\_\_\_\_\_ Non-standard details reviewed with appropriate personnel.

\_\_\_\_\_ Clear border provided around sheet; 5/8" sides, 1/4" top & bottom.

\_\_\_\_\_ Cadd files drawn with the correct levels for printing color plans.

\_\_\_\_\_ Project number in the border all sheets for each design. For routes that are not three digits include the leading zero(s) before the route number (e.g. BRF-063-3(46)—38-62).

\_\_\_\_\_ Standard abbreviations used. See [LRFD BDM 11.1.4].

\_\_\_\_\_ Precast culvert alternate is included for culverts meeting the alternate criteria. See [MM 125].

\_\_\_\_\_ Bent bar details include the note, "Note: All dimensions are out to out. D = pin diameter."

## 2. TITLE SHEET - ALL PROJECTS

### 2.1 General

\_\_\_\_\_ Title sheet conforms to current DOT format posted on Office of Bridges and Structures web site.

\_\_\_\_\_ Correct Project Number (upper right side, right lower border and top left border of sheet).

\_\_\_\_\_ Correct PIN Number (upper right side of sheet).

\_\_\_\_\_ Correct File Number and Project Directory Name (lower border).

\_\_\_\_\_ "Letting Date" filled in with the letting date (upper left border).

\_\_\_\_\_ ~~Value Engineering Note.~~

\_\_\_\_\_ Culvert Standard Plan Box.

\_\_\_\_\_ Boxed note referencing Road Standards on road sheets.

\_\_\_\_\_ Index of Seals (sheet number seal is located on, name and expertise).

\_\_\_\_\_ For projects referencing standard culvert plans include the engineer who signed the standard in the index of seals. See [MM 219].

\_\_\_\_\_ County Name (center of sheet, lower border and bottom left border).

\_\_\_\_\_ Proper sheet heading ("Primary", "Interstate", etc.).

\_\_\_\_\_ Proper 'Work Type'. See Bid Item Book (Ex.: "RCB Culvert New – Twin Box") (center of sheet, top left border).

\_\_\_\_\_ Verbal location ("on U.S. 151 over N. Fork ...") (center of sheet).

\_\_\_\_\_ Revision box

\_\_\_\_\_ Traffic data shown on title sheet only unless more than one structure is included in the plans. For multi-structure plans show the traffic data on each individual situation plan.

\_\_\_\_\_ Traffic data includes % trucks.

\_\_\_\_\_ "Sheet Number 1" bottom right border.

\_\_\_\_\_ No phone number on shop drawing 'reviewed by' note.

### 2.2 Location Map

\_\_\_\_\_ Remove references to scales on plans.

\_\_\_\_\_ North arrow, North is up

\_\_\_\_\_ Map Township/Range (Ex.: "R-2W", "T-87N").

\_\_\_\_\_ For larger scale urban map, "Part of City of xx."

\_\_\_\_\_ Leader to Culvert location with text "Design No. xx."

### 2.3 Index of Sheets

\_\_\_\_\_ Sheet containing 'Estimated Culvert Quantities' tabulation referenced (tabulation containing total culvert quantities).

\_\_\_\_\_ Sheet containing 'Estimated Roadway Quantities' referenced

\_\_\_\_\_ Any tabulations summarizing pay quantities not included in the culvert and road tabulations above referenced.

\_\_\_\_\_ Typically need not itemize RCB culvert sheets: Just indicate "Design No. xx"

## 3. FIRST SHEET OF DESIGN - ALL PROJECTS

### 3.1 General

\_\_\_\_\_ Traffic Control Note, in box.

\_\_\_\_\_ Roadway quantities note.

\_\_\_\_\_ Pollution prevention plan note. See [PRCN 3.1(A)].

\_\_\_\_\_ Repair Project: Design history tabulation (see standard sheet 1038/M1038).

\_\_\_\_\_ Replacement Project: Design history tabulation (see standard sheet 1038/M1038).

### 3.2 Specifications 'Note'

\_\_\_\_\_ Correct 'Specifications' note. See [LRFD BDM 11.2.2] note E50\_/M50\_.

## CULVERT PLAN REVIEW CHECKLIST

- \_\_\_ Supplemental specifications, developmental specifications and special provisions listed by name. See [PRCN 3.2(A)].
- \_\_\_ Electronic copy of special provisions (if necessary) placed in the special provision turn in folder. See [PRCN 3.2(B)].
- \_\_\_ If Standard 'G1' applies, do not duplicate.

### 3.3 Design Stresses 'Note'

- \_\_\_ Correct 'Design Stresses' note'. See [LRFD BDM 11.2.2] note E50\_/M50\_.
- \_\_\_ If Standard 'G1' applies, do not duplicate.

### 3.4 Quantity Tabulation

- \_\_\_ Quantity tabulation for design provided on this sheet.
- \_\_\_ Tabulation title "Estimated Culvert Quantities"
- \_\_\_ Column in tabulation for 'As-Built' quantities.
- \_\_\_ All Item Codes and Descriptions agree with BIAS. - OK to use 'short' BIAS description and capitalized units in BIAS table.
- \_\_\_ Estimated quantities reflect addition of itemized tables in plans.

### 3.5 Estimate Reference Information Notes

#### 3.5.2 Repair Project

- \_\_\_ 'Temporary Barrier Rail' nominal 12'-6 units [PRCN 3.5.2(D)] or steel [PRCN 3.5.2(E)]. See [LRFD BDM 5.8.1.3].

### 3.6 General Notes

#### 3.6.1 All Projects

- \_\_\_ All applicable 'standard' general notes (per design manual) provided. 'Non-standard' notes checked for need and do not conflict with standard specifications and standard plan details.
- \_\_\_ If Standard 'G1' applies, do not duplicate General Notes.

#### 3.6.2 Repair Project

- \_\_\_ 'Removals, As Per Plan' [LRFD BDM 11.5.2] note E440/M440 provides complete listing of work included in item.

## 4. SITUATION PLAN (Placed after General Notes and Estimated Quantities sheet)

### 4.1 New Construction

#### 4.1.1 General

- \_\_\_ Location information near title block. Example:  
(Relocated) U.S. 151 Over Maquoketa River  
T87N R2W  
Section 36  
Cascade Twp.  
Dubuque County  
City of \_\_\_\_\_  
FHWA # \_\_\_\_\_ - on all RCB culverts > 20' along roadway
- \_\_\_ Traffic data shown - only for multiple designs in the same plan.
- \_\_\_ Hydraulic data
- \_\_\_ Profile data, check for coordination with roadway design.

#### 4.1.2 Plan

- \_\_\_ Shoulder and approach pavement widths and slopes (include foreslope) shown for main and crossing roadway, check for coordination with roadway design.

- \_\_\_ Horizontal curve data, check for coordination with roadway design.
- \_\_\_ Alignments and stationing along CL of approach roadway (and equations), check for coordination with roadway design. Label profile grade line.
- \_\_\_ Proposed ditches and pipes shown, check for coordination with roadway design.
- \_\_\_ Any removals to be performed by culvert contractor designated.
- \_\_\_ 'Back to back of parapets' dimension shown.
- \_\_\_ Length from centerline roadway left to back of parapet dimension shown.
- \_\_\_ Length from centerline of roadway right to back of parapet dimension shown.
- \_\_\_ Lengths of individual sections dimension shown.
- \_\_\_ Angle of skew tangent from centerline of roadway dimension shown.
- \_\_\_ Label headwall size and skew angle.
- \_\_\_ Existing structure(s) shown.
- \_\_\_ Highway name.
- \_\_\_ Pertinent structures and features close enough to influence construction shown (utilities, old structures, etc.).
- \_\_\_ Include [LRFD BDM 11.7.2] note M608 if metric.

### 4.1.3 Longitudinal Section

- \_\_\_ Channel excavation limits with slopes, dimensions and elevations.
- \_\_\_ Following elevations labeled and shown:
  - Profile grade at centerline of roadway or at centerline of survey or at office relocation centerline.
  - Shoulder elevations.
  - Flowlines at inlet and outlet.
- \_\_\_ Foreslopes labeled (6:1, etc.) (additional slopes when applicable (e.g. flumes and drop inlets)).
- \_\_\_ Benchmark
- \_\_\_ Dimension fill height (Use 1' increments). See Culvert Design Manual for metric conversion.
- \_\_\_ "Anticipated settlement = \_\_\_\_" below view title.
- \_\_\_ Bell joints standard note, if necessary.

### 4.2 Repair/Extensions Projects

#### 4.2.1 General

- \_\_\_ Location information near title block. Example:  
U.S. 151 Over Maquoketa River  
T87N R2W  
Section 36  
Cascade Twp.  
Dubuque County  
City of \_\_\_\_\_  
FHWA # \_\_\_\_\_ - on all RCB culverts > 20' along roadway
- \_\_\_ Traffic data shown - only for multiple designs in the same plan.

#### 4.2.2 Plan

- \_\_\_ Alignments and stationing.

## CULVERT PLAN REVIEW CHECKLIST

- \_\_\_ 'Back to Back of Parapets' dimension shown.
- \_\_\_ Highway name shown.
- \_\_\_ Legend of work to be performed.

- \_\_\_ Vent hole layout for flowable mortar placement if necessary. See [MM 191].

### 5. DETAILS - REPAIR/EXTENSION PROJECTS

#### 5.1 General

- \_\_\_ For an existing culvert that is being extended and the headwall is at a skew to the culvert (not perpendicular) the culvert is "not" to be squared up. The headwall is to be removed but the proposed culvert is to be attached along the skew line.
- \_\_\_ If an existing culvert is being extended at a different skew, a minimum 3' (900 mm) section (on the shortest wall) is to be attached to the existing culvert prior to the proposed bend.
- \_\_\_ If an existing culvert is non-standard, it is to be extended with the same size non-standard culvert (assuming an RCP would not work).
- \_\_\_ Adequate details provided to define location and scope of concrete repair work.
- \_\_\_ Proposed flowable mortar RCB culverts for bridge replacement should allow a minimum of 3' (900 mm) vertical clearance and 2.5' (760 mm) side clearance for constructability.

#### 5.2 Temporary Barrier Rail

- \_\_\_ Reduced width signing plan provided if lane width less than 14'-6 (4.42 m). See [LRFD BDM 9.1.8.2].
- \_\_\_ 'F-Shape' used for min. lane 12.42' (3.78 m) interstate mainline, 10'-6" (3.2 m) primary. H-Pile section used when these minimums cannot be provided.
- \_\_\_ Traffic lane and work area widths shown on rail layout plan. Correct lane width shown on standard sheet 1049/M1049 note. Traffic lane width should be noted as 'minimum'.

### 6. RCB CULVERTS

- \_\_\_ If fill exceeds maximum used for standards, check that culvert program has been run and output matches values on plan. If metric culvert, check that program output has been converted properly.
- \_\_\_ Check that fill height is included in general notes. Design assumption is that floor of culvert is not placed on bedrock.
- \_\_\_ When using a non-standard barrel, the bell joint sheet must also be modified.
- \_\_\_ Check for appropriate use of bell joints. If flume, include bell joints at junction of culvert end barrel section and flume. If tapered inlet, include a bell joint at junction of tapered inlet and culvert barrel section.
- \_\_\_ Prefer to use "granular material for blanket and subdrain" when a granular blanket is necessary.
- \_\_\_ Do not use the term "working" with blankets.
- \_\_\_ Check if openings for pipes, or weepholes are necessary.
- \_\_\_ Bends located internal to section, not at joint locations.
- \_\_\_ End section minimum/maximum lengths per Design Manual.
- \_\_\_ Avoid joints below centerline of roadway (especially for 5' (1.5 m) of fill or less), if possible.
- \_\_\_ For culverts without fill current notes and details are used. See [MM 169].

### 7. ROADWAY PLANS

- \_\_\_ Erosion control, including seeding and mulching, bid items (all projects) - do not include as incidental items.
- \_\_\_ Traffic control bid items (all projects where required by traffic control plan).
- \_\_\_ Traffic control plan current and acceptable to Office of Design.
- \_\_\_ PPP current, consistent with grading plan and acceptable to Office of Design.

### REFERENCE ABBREVIATIONS

BDM – Bridge Design Manual  
MM – Methods Memo  
PRCN – Plan Review Checklist Notes  
CADD M – CADD Memo